

REMARKS

This is a divisional application of USSN 09/442,000, now U.S. Patent No. 6,486,316 B1. Claims 1 to 31 are pending in this application. Claims 4 and 23 are currently amended, Claims 1, 2, 5 and 16 were previously amended and claims 20 to 31 were previously added.

The amendment to claims 4 and 23 were made to clarify that the carbonyl is a carbonyl compound and not a group. This is not a narrowing amendment, but merely clarifying and redefining that the applicant is claiming carbonyl compounds and not carbonyl groups.

Claims 1 to 31 were rejected in the instant Office Action under 35 U.S.C. § 112 second paragraph for not distinctly claiming the subject matter of the invention. This objection is to the term "reaction promoter" because the Office Action contends that reaction promoter could include solvents and the proviso at the end of claim 1 appears to exclude solvents. This rejection is respectfully traversed. The meaning of the proviso at the end of claim 1 is that the reaction promoter and the solvent can not be the same compound. In other words, one compound can not act simultaneously in the reaction as both a reaction promoter and a solvent. They must be separate distinct compounds as recited in the claims. However, the same compound can act as a solvent in one reaction and as a reaction promoter in a different reaction. The meaning of the term "reaction promoter" is clearly spelled out on page 21, lines 12 to 18 of the current specification (paragraph 63 of the published application). The inventors have discovered that the formation of an aryl substituted 1,3,5-triazine compound using a Lewis acid is facilitated when an additional component, i.e., a reaction promoter, is added in combination with the Lewis Acid catalyst. This reaction promoter encompasses a wide variety of components as disclosed in the body of the specification and proved in the Examples.

The rejection of claim 4 under 35 U.S.C. § 112 second paragraph has been rendered moot by the amendment to the claim.

Claims 1 to 31 were rejected under 35 U.S.C. 103(a) as being obvious under U.S. Patent No. 1,551,095 to Fritzsche et al. (Fritzsche) and under U.S. Patent No. 3,118,887 to Hardy et al. (Hardy) in view of Fritzsche. These rejections were same as made in the previous Office Action except Claims 20 to 31 were also rejected in this Office Action.

The Office Action rebuts Applicants previous argument relying on *In Re Royka* whereby Fritzsche does not disclose or teach all the recited elements in the claims. Although Applicants disagree with the Office Action's contention, in order to expedite examination, Applicants respectfully withdraw reliance in *In Re Royka*.

However, and with all due respect, Applicants respectfully submit that the present Office Action did not address Applicants many other arguments made in the previous

response. For example, this Office Action failed to address and take proper consideration of the unexpected result of the claimed combination of the reaction promoter and Lewis Acid. For example, the results in Example 7 of the present invention demonstrate that the addition of a reaction promoter greatly increases yield and selectivity to the 2-halo-4,6-bisaryl-1,3,5-triazine compounds of formula III. Several other examples also support this unexpected result. Applicants especially wish to point out Example 61 to 65 and Comparative Examples 61 to 65 showing the unexpected results of greatly increased yields and selectivity to the asymmetrical 2-halo-4,6-bisaryl-1,3,5-triazine of the present invention when samples are prepared with a reaction promoter and Lewis Acid, (Examples 61 to 65), as compared to samples prepared without a reaction promoter (Comparative Examples 61 to 65).

The present rejection should include consideration of the unexpected properties of the claimed process. *In re Dillon*, 919 F2d 688, 692-693, 16 U.S.P.Q.2d 1897, 1901 (Fed. Cir. (en banc), cert. denied, 500 US 904 (1991)); *In re Huellmantel*, 324 F2d 998, 139 U.S.P.Q. 496, 498-499 (CCPA 1963). Since there is no teaching, disclosure or even a hint in Fritzsche or Hardy that the addition of a reaction promoter would greatly increase yield and selectivity to the asymmetrical 2-halo-4,6-bisaryl-1,3,5-triazine of the present invention, the 103(a) rejection should be withdrawn. Again, Applicants respectfully request that this unexpected result be addressed and given its proper consideration with respect to the issue of obviousness.

Furthermore, Applicants also respectfully submit that the Office Action has not made a proper *prima facie* case for obviousness because in order to establish a proper rejection under 35 U.S.C. 103(a), the prior art itself must suggest the modification or provide the reason or motivation for making such modification. *In re Laskowski*, 871 F2d 115, 117, 10 U.S.P.Q.2d 1397, 1398-99 (Fed. Cir. 1989). The Office Action contends that it would have been obvious to combine the Lewis Acid in Example 1 of the Fritzsche patent with sulfuric acid in Example 2. However, merely because both compounds are disclosed in the application in separate reactions does not mean that one would be motivated to used both compounds in one reaction. "It is axiomatic that a claimed invention is not obvious solely because it is composed of elements that are all individually found in the prior art." *Life Technologies Inc., v. Clonitech Laboratories Inc.*, 56 USPQ2d 1186, 1190 (Fed. Cir. 2000). In col. 1, lines 33 to 36, Fritzsche discloses that the reaction takes place "preferably in the presence of condensing agents, such as aluminum chloride or sulfuric acid". Sulfuric acid, in this case, is being taught as an alternative condensing agent to aluminum chloride (Lewis Acid). Hence, Fritzsche teaches that these compounds are equivalent. There is no incentive to choose one over the other, and there is no incentive or motivation to combine aluminum chloride with sulfuric acid since both agents can be used equivalently in the disclosed reaction. Since Fritzsche does not disclose or teach any synergistic or other

desirous effect, such as obtaining 2-halo-bisaryl triazine with high selectivity, if a Lewis Acid and a sulfuric acid are combined, the 103(a) rejection should be withdrawn. Applicants respectfully request that this argument be taken into consideration with respect to the present obviousness rejection.

Fritzsche actually teaches away from the present invention. Fritzsche teaches in Example 2 that no catalyst is needed in order for the reaction to occur. Thus, Applicants respectfully submit that there is no motivation in Fritzsche to combine both a Lewis Acid and sulfuric acid (reaction promoter) in one reaction since the reactions disclosed in Fritzsche does not require any catalyst. Why would one skilled in the art use two additional components in the reaction when neither one is actually required? At most, Fritzsche may teach the addition of one component to accelerate a reaction, but certainly does not teach the addition of both a Lewis Acid and sulfuric acid (reaction promoter) in one reaction. Similarly, Example 3 in Fritzsche, contains a Lewis Acid and tetrachlorethane as an **indifferent diluent** (see col. 1, line 35 to 38), but does not contain a reaction promoter. The Office Action contends that the tetrachlorethane in Example 3 can be both a reaction promoter and a solvent. However, according to the plain meaning of the proviso of the instant claims, one compound can not act simultaneously as both a reaction promoter and solvent in a given reaction. For example, in the instant invention, when tetrachloroethane is used as a solvent, resorcinol is used as a reaction promoter (please see Examples 12 and 13). Applicants respectfully request that this argument be taken into consideration with respect to the present obviousness rejections.

The Office Action's reliance on Hardy is misplaced since Hardy only teaches the use of a Lewis Acid with cyanuric chloride. Since Fritzsche also discloses the use of a Lewis Acid in Example 3, Hardy does not disclose or teach anything more than Fritzsche already teaches. Neither document alone or in combination teaches the combination of a Lewis Acid and a reaction promoter in one reaction. In addition, neither document alone or in combination teaches that the combination of a Lewis Acid and a reaction promoter would greatly increase yield and selectivity to the asymmetrical 2-halo-4,6-bisaryl-1,3,5-triazine of the present invention. A rejection is erroneous where there is a lack of any suggestion or motivation in the prior art to combine the specific components as combined by the inventor so as to obtain the enhanced properties of the invention. *In re Newell*, 891 F2d 899, 13 U.S.P.Q.2d 1248 (Fed. Cir. 1989). The prior art must contain both the suggestion of the combination and the expectation of the source in obtaining the results desired. This must be in the prior art, not in applicant's disclosure. *In re Dow Chemical Co.*, 837 F2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988).

In addition, Hardy's disclosure must be read as a whole for what it teaches. Hardy teaches a process for the preparation of ortho-hydroxy substituted tris aryl 1,3,5-triazines.

The trisaryl-triazines taught by Hardy, however, are symmetrical compounds. (See Hardy, Examples 2, 4, 8 and 12, as mentioned by the Office Action.) Hardy merely discloses the preparation of asymmetrical triazines by reacting cyanuric halide with one or two molecular proportions of an aromatic compound to yield intermediates, then treating the intermediate compounds with one or two molecular proportions of another aromatic compound to yield a second intermediate, and finally treating the second intermediate with a third aromatic compound to yield the asymmetrical product (col. 3, lines 1-9). The examples disclosed in Hardy which use Friedel-Crafts chemistry, however, all relate to the preparation of **symmetrical** trisaryl-triazine products (Examples 2, 4, 8, 11, 12 and 15). The examples disclosed in Hardy which lead to the production of asymmetrical triazines involve different chemical techniques, such as the use of a Grignard reagent (Example 16), or reaction of species other than a cyanuric halide (Examples 5, 6, 7, 13 and 14) in a first step, followed by a Friedel-Crafts reaction in a second step. Hardy contains no example that teaches the use of Friedel-Crafts chemistry alone for the preparation of asymmetrical trisaryl-triazines or 2-halo-bisaryl-triazines, directly from cyanuric halide.

Again, the Office Action failed to take into consideration the unexpected results leading to the preparation of the desirous 2-halo-4,6-bisaryl triazine of the present invention. As discussed in the specification on page 4, lines 21 to 34, and discussed in currently submitted U.S. Patent No. 3,394,134 to Duennenberger et al. (Duennenberger), reaction of cyanuric chloride with aluminum chloride and aromatic groups lead to a general mixture of mono-, di- and tri-substituted products with unreacted cyanuric chloride (See Duennenberger, col. 1, lines 33 to 47). Duennenberger states "It is therefore easy to realize why for the manufacture of unitary monosubstituted dichlorotriazines and **disubstituted monochlorotriazines** other routes were used in which cyanuric chloride was not used as a starting material and the triazine ring was synthesized by different methods" (See Duennenberger, col. 1, lines 41 to 46). Therefore, the prior art teaches away from using Friedel-Crafts reaction of aromatics with cyanuric halide and aluminum chloride to produce aryl disubstituted monochlorotriazines (2-halo-bisaryl triazines). Hardy reinforces this contention by not producing 2-halo-bisaryl triazines with cyanuric halide and aluminum chloride using Friedel-Crafts chemistry. In contrast, the Examples of the present invention demonstrates that when a reaction promoter is used in conjunction with Lewis Acid and cyanuric halide, the desired 2-halo-4,6-bisaryl triazines are readily obtained in high yield.

The rejection of claims 1 to 31 under 35 U.S.C. 103(a) as being obvious under Hardy and U.S. Patent No. 6,242,598 to Stevenson et al. (Stevenson) in view of Fritzsche is respectfully traversed. Applicants respectfully submit that Stevenson is not a proper prior art reference.

The present application was filed on February 9, 2001 and Stevenson issued on June 5, 2001. Therefore, Stevenson can only be prior art under 102(e)(2) since Stevenson did not publish under 35 U.S.C. 122b. Applicants believe Stevenson's 102(e)(2) date is March 22, 2000 since the parent application was abandoned. Since this divisional application has a priority date of November 17, 1999 based on the parent application, it predates Stevenson's March 22, 2000 102(e)(2) filing date. Therefore, Stevenson is not a proper prior art reference.

Without Stevenson as a prior art document, the rejection is based on Hardy in view of Fritzsche, which has been addressed above. Accordingly, this 103(a) rejection should be withdrawn.

It is believed that the pending claims 1 to 31 are in condition for allowance and an early notification of such allowance would be appreciated.

If any outstanding issues remain, the Examiner is invited to telephone the undersigned at the number indicated below. Except for the Petition for Extension of Time and the Supplemental Information Disclosure Statement, no fee is believed due for this Amendment. If any fee is due, please charge the fee to Deposit Account 03-4083.

Respectfully submitted



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